

Five Maths Activities with Logo - Teacher's Notes

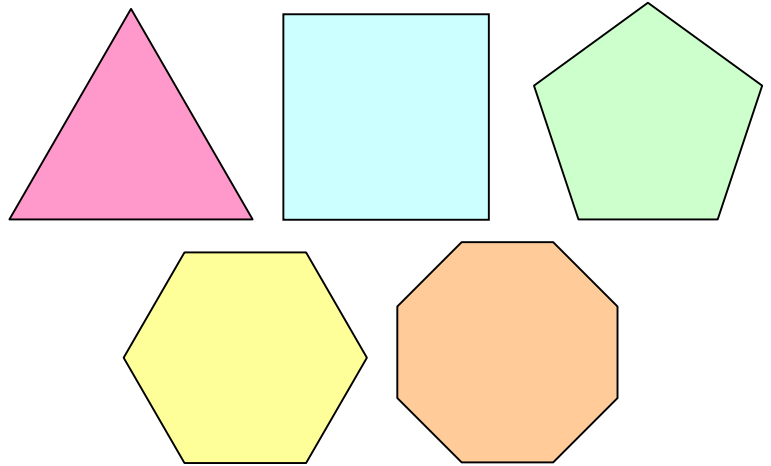
These activities can be tackled by pupils using a logo. The activity sheets do not teach them specific logo features or skills; it is assumed that the pupils will already have the necessary ICT capability to use logo effectively. The purpose of these activities is to provide opportunities to use and apply both maths and ICT skills that have been taught on earlier occasions.

It is also assumed that the teacher will introduce and discuss each activity by interacting with the whole class at the start of the lesson, rather than simply hand out the sheets with no explanation. The plenary can be used to discuss the outcomes of the activity, reinforce the key points and reflect on the lesson's learning objectives.

Regular Polygons and Stars

Use logo to draw

- an equilateral triangle
- a square
- a regular pentagon
- a regular hexagon
- a regular octagon
- a regular nonagon
- a regular decagon
- a regular dodecagon



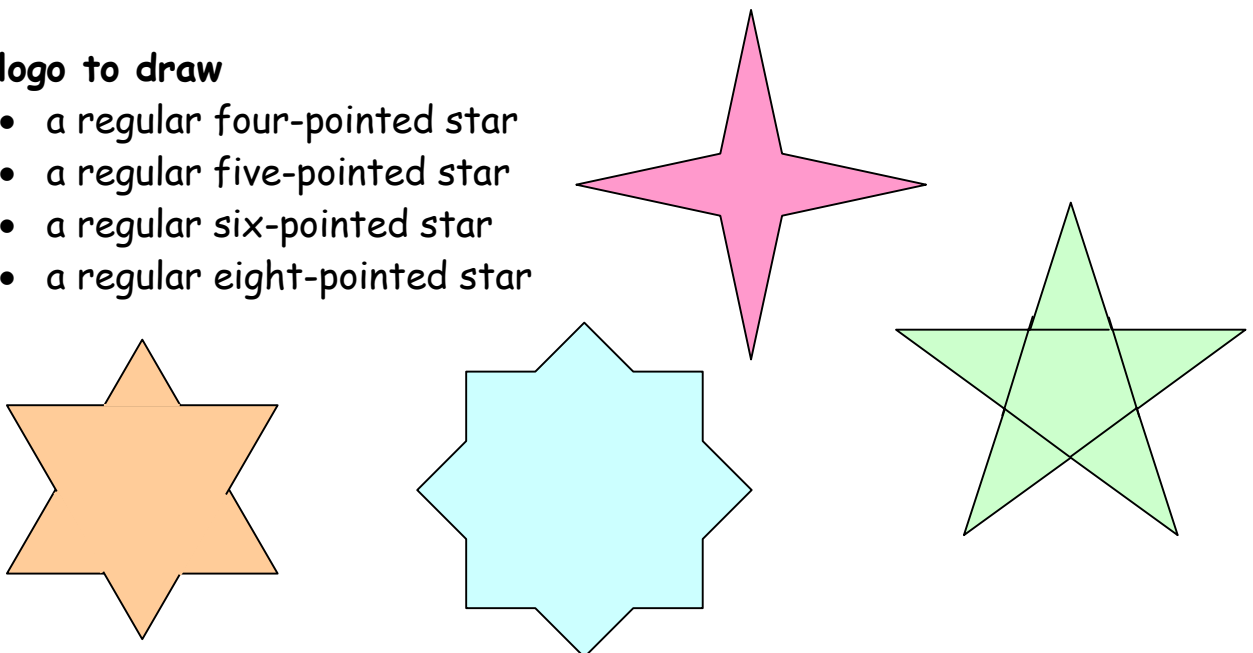
Can you see the connection between the number of sides a regular polygon has, and the angle you have to turn through after drawing each side?

If you didn't use the REPEAT facility to draw your polygons, find out about this and then draw them again, this time using REPEAT.

Find out about logo procedures and then write a procedure to draw each of the regular polygons.

Use logo to draw

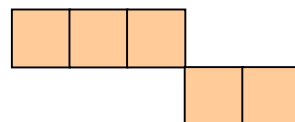
- a regular four-pointed star
- a regular five-pointed star
- a regular six-pointed star
- a regular eight-pointed star



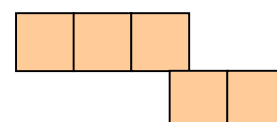
Pentominoes

A pentomino is a shape made by shading in five connected squares on a piece of squared paper. The squares must be connected along their edges, not just at the corners.

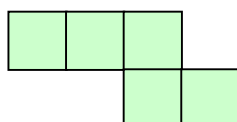
This is not a pentomino because two of the squares are not connected along an edge.



This is not a pentomino because you cannot shade in five squares like this.



This is a pentomino.



On squared paper draw as many different pentominoes as possible. You should be able to find more than ten.

Make sure all of your pentominoes are different! If you can cut out one pentomino and fit it on top of another one (even if you have to turn it round or flip it over), then the two pentominoes are the same.

Logo Activity

Use logo to draw each of the pentominoes you found earlier.

You could write a procedure which will draw each of the pentominoes.

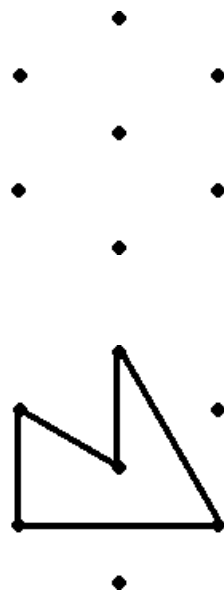
Seven Pin Polygons

Your teacher will provide you with a sheet with lots of hexagonal arrangements of dots like this.

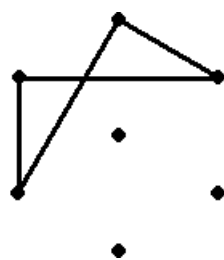
You can also make these arrangements on triangular spotty paper.

You can make seven-pin polygons by joining some or all of the seven dots (a polygon is an enclosed shape made from straight lines).

Here is an example of a seven-pin polygon.



This is not a seven-pin polygon because it is in fact two shapes and one of the corners does not lie on a dot.



Try to find as many different seven-pin polygons as you can.

Record them on the paper provided by your teacher. You should be able to almost fill the sheet with different seven-pin polygons.

Make sure all of your seven-pin polygons are different! If you can cut out one and fit it on top of another (even if you have to turn it round or flip it over), then the two are the same.

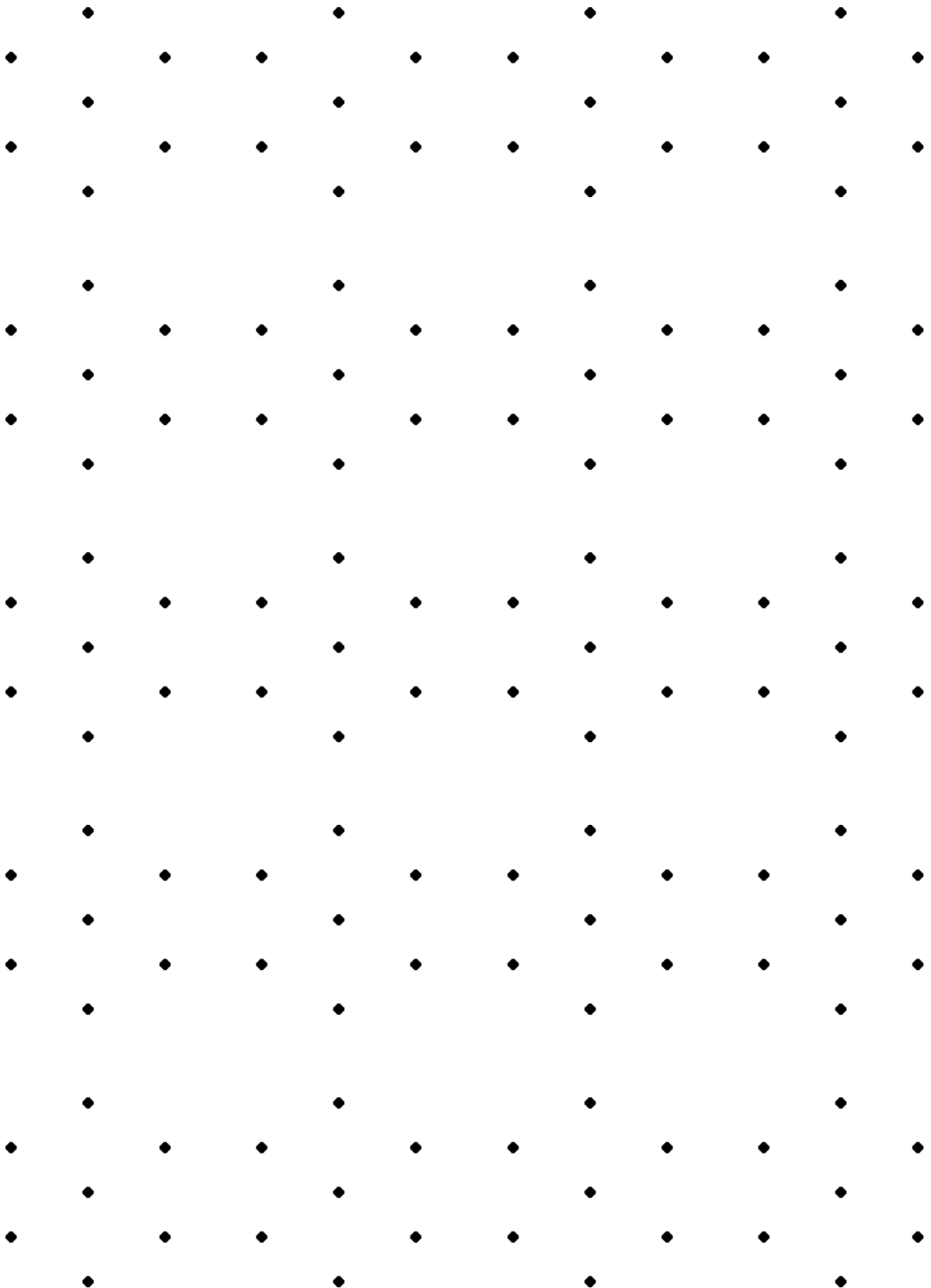
Many of the seven-pin polygons have mathematical names. Try to name as many of them as you can.

Logo Activity

Use logo to draw each of the seven-pin polygons you found earlier.

You could write a procedure which will draw each one.

Seven Pin Polygons Worksheet



Symmetry with Logo

Use logo to draw ...

- A shape with exactly one line of symmetry.
- A shape with exactly two lines of symmetry.
- A shape with exactly three lines of symmetry.
- A shape with exactly four lines of symmetry.
- A shape with exactly six lines of symmetry.
- A shape with rotational symmetry order 2 but no lines of symmetry.
- A shape with rotational symmetry order 3 but no lines of symmetry.
- A shape with rotational symmetry order 4 but no lines of symmetry.
- A shape with rotational symmetry order 6 but no lines of symmetry.

Can a shape have two lines of symmetry but no rotational symmetry?

Can a shape have three lines of symmetry but no rotational symmetry?

Can a shape have only one line of symmetry and also have rotational symmetry?

If you have answered 'yes' to any of these questions, draw the shape.

Create these two procedures:

```
TO SQUARE
```

```
REPEAT 4[FD 100 RT 90]
```

```
END
```

```
TO PATTERN
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```
REPEAT 12[SQUARE RT 30]
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END
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Type PATTERN to run the second procedure.

Describe the symmetry of the pattern that is produced.

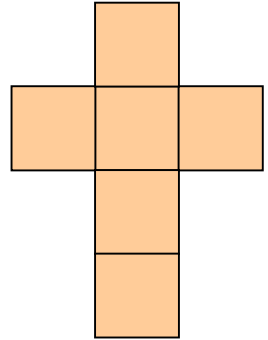
In the second procedure change the number of repeats and the angle after the 'RT' (they must multiply to give 360) and run the procedure again. Describe the symmetry of the pattern that is produced.

Also try rotating other shapes instead of a square.

Nets of a Cube

Here is the net of a cube.

If this shape was cut out it would fold together to make a cube.



It is not the only net of a cube.

Try to find as many different nets of a cube as you can.

Draw them on squared paper or square-spotty paper.

Make sure all of your nets are different! If you can cut out one net and fit it on top of another (even if you have to turn it round or flip it over), then the two nets are the same.

You should be able to find ten more nets of a cube.

Logo Activities

Use logo to draw each of the nets of a cube you found earlier.

You could write a procedure which will draw each net.

Write a second set of procedures which draw the nets of a cube but this time include tabs for sticking so that you can print each net, cut it out, and assemble it to make a cube.